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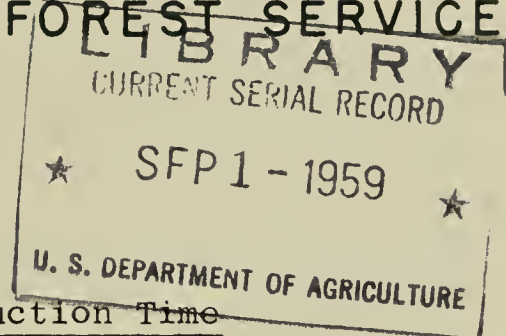


# TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION  
U.S. DEPARTMENT OF AGRICULTURE · · FOREST SERVICE

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## Air Seasoning of Wood Reduces Charcoal Production Time

Forty percent less time was required to carbonize air-seasoned sugar maple (Acer saccharum Marsh.) than green sugar maple in a series of burns carried out in northern Wisconsin. Average carbonization time was 20 hours for the green maple and 12 hours for the air-seasoned wood.

Six experimental burns were made in a 3-cord, cinder-concrete block kiln<sup>1/</sup> -- three with freshly cut hard maple and three with wood that had been air seasoned for 2 years in uncovered piles. Average moisture contents of the green and seasoned wood were 62.2 and 35.3 percent, respectively.

Each kiln charge consisted of 4-foot rough roundwood, about 6 inches average diameter, piled in two 5-foot-high tiers on 7-inch stringers. Ignition was from a combustion chamber at the geometric center of the floor; draft was through 4 stacks, one at each kiln corner. Average charcoal yields, based on oven-dry weight of the kiln charges, were 26.4 percent for the green maple and 29.3 percent for the seasoned material.

Average hourly kiln temperatures (fig. 1) were measured by evenly spaced thermocouples in the kiln ceiling, midway between the ceiling and kiln floor, and 12 inches above kiln floor. All temperatures were controlled by regulating the volume of air supplied to the combustion chamber through a 6-inch pipe by a centrifugal fan.

As each burn progressed, the air intake was periodically reduced just enough to keep average ceiling temperatures under 1000° F. and allow the lower load temperatures to build up to 800° F. Previous tests indicated that for good charcoal yields average temperatures within the bottom of the charge have to be maintained at or above 800° F. at least 8 hours for green maple and at least 4 hours for air-seasoned maple. When the required temperature conditions were satisfied, the air intake was closed and the kiln sealed.

More heat is needed to carbonize green wood than air-seasoned wood (fig. 1). This is because more water must be removed before carbonization is possible. Because of the characteristics of wood carbonization and the temperature limitations within the cinder-concrete block kiln, it is necessary to extend the cycle time rather than increase the average hourly kiln temperatures.

July 1959

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<sup>1/</sup> Lane, Paul H. Design of a cinder-concrete block charcoal kiln. U. S. Forest Serv., Lake States Forest Expt. Sta. Tech. Note 494, 2 pp., illus. (Processed.) 1957.

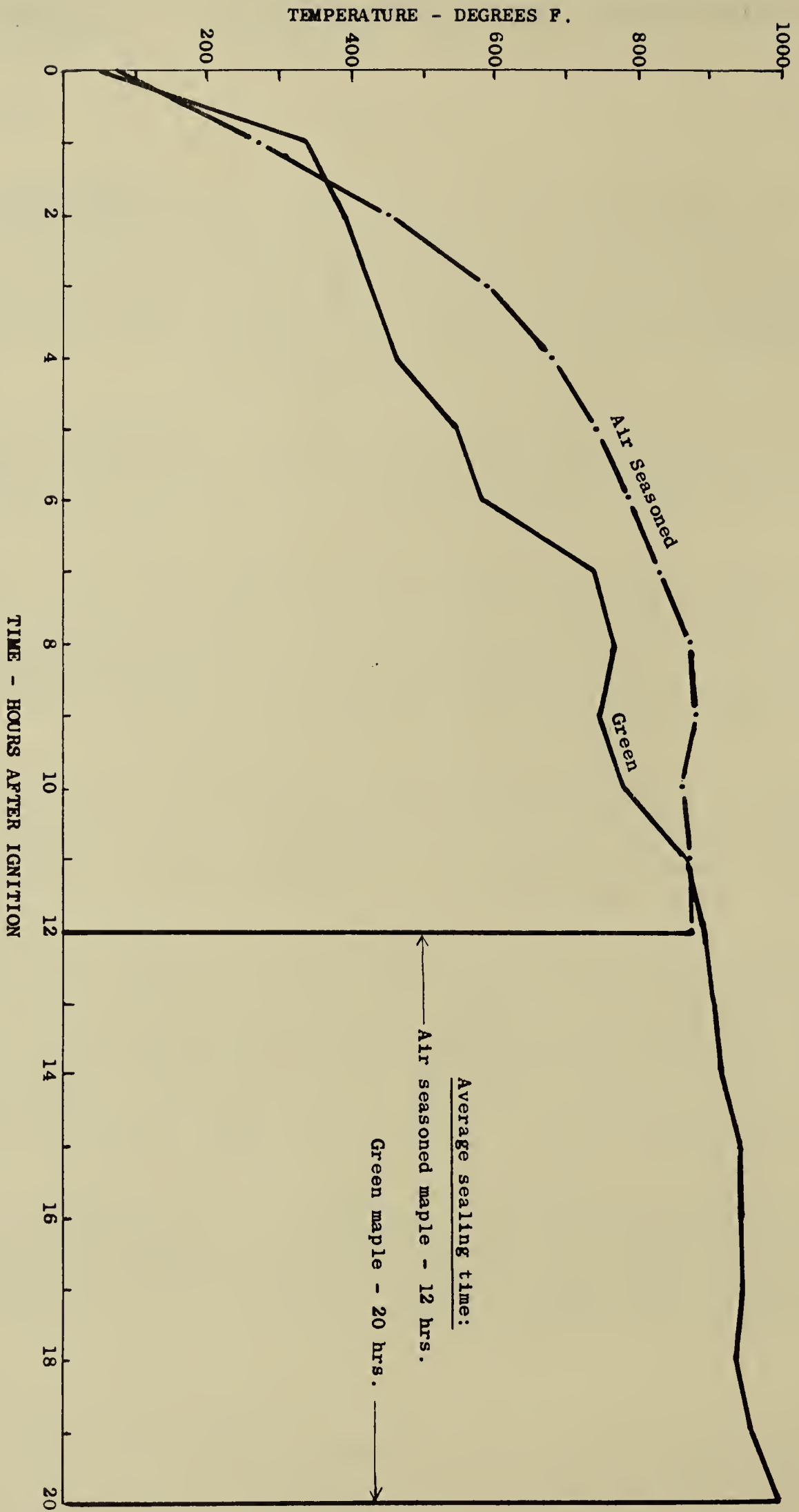


Figure 1.--Comparison of average charcoal kiln temperatures for air-seasoned and green sugar maple based on three burns each.